Evaluation of the current state and perspective of wastewater treatment and reuse in Qatar

Yehia Manawi\textsuperscript{a,b}, Ahmad Kayvani Fard\textsuperscript{a,b}, Muataz A. Hussien\textsuperscript{a,b}, Abdelbaki Benamor\textsuperscript{c}, Victor Kochkodan\textsuperscript{a,*}

\textsuperscript{a}Qatar Environment and Energy Research Institute (QEERI), Hamad bin Khalifa University (HBKU), Qatar Foundation, Doha, Qatar, Tel. +974 4454 48122; email: vkochkodan@qf.org.qa (V. Kochkodan), Tel. +97444541540; email: ymanawi@qf.org.qa (Y. Manawi), email: afard@qf.org.qa (A.K. Fard), email: mhusssien@qf.org.qa (M.A. Hussien)

\textsuperscript{b}College of Science and Engineering, HBKU, Qatar Foundation, P.O. Box 5825, Doha, Qatar, email: ymanawi@qf.org.qa (Y. Manawi), email: afard@qf.org.qa (A.K. Fard), email: mhusssien@qf.org.qa (M.A. Hussien)

\textsuperscript{c}Gas Processing Center, College of Engineering, Qatar University, P.O. Box 2713, Doha, Qatar, Tel. +97444034381, email: benamor.abdelbaki@qu.edu.qa

Received 16 May 2016; Accepted 21 August 2016

ABSTRACT

In Qatar, many freshwater resources have already been depleted due to the overconsumption as a result of the population and economic growth. Moreover, due to the lack of sufficient sewage treatment infrastructure, Qatar is facing a daily problem in treating the wastewater. Dumping untreated sewage effluents (SE) contaminates groundwater resources and worsens the current water status in the country. On the other hand, treated SE (TSE), which is estimated at about 0.75 million m$^3$/d, could be one of the main sources of fresh water which can be used in agriculture and industry and even as a source of drinking water in Qatar. Qatar uses only about 27% of TSE in growing fodder (25 million m$^3$/y) and landscape irrigation (1 million m$^3$/y) while about 73% of the total TSE is discharged to septic lagoons to dry or percolate into groundwater (70 million m$^3$/y) and runoff (0.5 million m$^3$/y). Qatar can better utilize its TSE in several applications by further treating the produced TSE. In this paper, a review on the current state and a perspective into the wastewater treatment and reuse in Qatar is presented. Moreover, the main aspects, which should be considered while making a decision on reusing the treated SE in Qatar, are also addressed.

Keywords: Sewage effluents; Wastewater treatment; Reuse of treated sewage effluents

* Corresponding author.